

#### CLAIMS

1 Process for deliming water and simultaneously removing pollutants, as  
5 well as the disinfection and destruction of permanent forms of parasites in  
a reactor with an inlet and outlet, accompanied by

a) heating of the water, so that the solubility of  $\text{CO}_2$  in water is  
reduced and  $\text{CO}_2$  desorption is initiated, which can also be increased by a  
10 pH-rise ( $2\text{HCO}_3 \rightarrow \text{CO}_3^{2-} + \text{CO}_2$ ) and where through a

b) simultaneous gassing by means of air introduction  $\text{CO}_2$  discharge is  
increased and

15 c) provision and arrangement of one or several removable or fixed plates  
in the reaction chamber with intense mixing accompanied by the deflection  
of the water flow at the reactor wall, as well as increased crystal  
nucleation and crystal growth on the wall and if necessary the heated water  
is kept at an elevated temperature and gassed or the further gassing takes  
20 place without heat supply and the resulting lime and fouling elements which  
have been deposited below the plate or plates and on the heating surfaces  
or reactor walls are detached by turbulence and discharged through the  
water.

25 2. Reactor for deliming water and simultaneously removing pollutants, as  
well as the disinfection and destruction of permanent forms of parasites,

- comprising a treatment chamber with an inlet for the water to be  
treated and an outlet for the treated water,  
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- with a direct or indirect heater for the water,

- one or more horizontal, removable plates for deflecting the water  
flow, which are fixed in the lower area of the reactor and spaced from its  
35 bottom and side wall,

- a gassing device outside the reactor having a pipe passing centrally  
into the reactor and with a gas distributor terminating below the plates,

40 - in the case of a discontinuously operated reactor the out let is  
positioned between the reactor bottom and the plate or plates, whereas for  
a continuously operated reactor the outlet is above the plate or plates.

3. Reactor according to claims 1 and/or 2, characterized in that the plates are fixed to the reactor cover by one or more high-grade steel bars.
4. Reactor according to claims 1 to 3, characterized in that together with the plate or plates it is made from stainless steel or any thermally resistant material with a high surface energy.
5. Reactor according to claims 1 to 4, characterized in that the plate or plates have a perforated border.
- 10 6. Reactor according to claims 1 to 5, characterized in that the reactor wall surface in contact with the water is rough.
- 15 7. Reactor according to claims 1 to 6, characterized in that there is a following second bubble column in the case of continuous operation.
8. Reactor according to claim 1, characterized in that for heating the water with an integrated electric heater, the heat supply to the reactor takes place directly or indirectly from below and/or laterally.
- 20 9. Reactor according to claim 1, characterized in that for heating the water use can be made of a double-walled reactor, in which by means of steam or hot oil and by heat exchange the reactor content can be heated.